

REMARKS

The Examiner has rejected claims 1 through 4 and 14 through 18 under 35 U.S.C. §102(b) as being allegedly anticipated by Yamashita et al. reference. For the rejection of independent claims 1, 14 and 15, the Examiner has pointed out specific portions of the Yamashita et al. reference. Based upon the following reasons to distinguish the cited prior art reference, Applicant respectfully requests the Examiner to reconsider the above rejections.

As explicitly recited in independent claims 1, 14 and 15, the current invention calls for “extracting a white pixel rectangle that circumscribes continuous white pixels within the parent rectangle of the framed candidate.” Furthermore, independent claims 1, 14 and 15 each explicitly recite “further determining whether or not the frame candidate is a frame based upon a predetermined set of second criteria, the second criteria including a comparison of a certain aspect between the white pixel rectangle and the black pixel rectangle.” In other words, the independent claims 1, 14 and 15 requires the determination “whether or not the [black pixel] frame candidate is a [true character] frame” in view of “a white pixel rectangle ... within the [corresponding] parent [black] rectangle.” The above “white pixel” based examination improves the accuracy of the frame determination.

In general, the Yamashita et al. reference discloses a method of extracting a tree structure of a document and generating a flexible layout model. The inputted document image is initially segmented by the automatic area segmentation unit 4A. For this process, the Yamashita et al. reference discloses that “[a]ccording to the known black components labeling method and run-length combining method, it is possible to express all character strings, black lines, and other black pixel regions from a document image by expressing them in rectangles.” (lines 18 through 22, column 4). The Yamashita et al. reference further discloses:

long, wide, and White pixel regions and long black lines to serve as separators for objects are extracted from the x,y-coordinates of the rectangles. Then, graphic areas are removed before character areas are roughly segmented using the extracted separator. Moreover, subseparators to server as a boundary between objects are obtained from the change of line pitch and character size in the character areas and the areas are sub-divided in accordance with the subseparators. (lines 44 through 52, column 3).

In other words, the Yamashita et al. reference completes the extraction of the character strings based upon the prior art techniques and subsequently segments these already extracted character strings into groups based upon the separators and subseparators.

In sharp contrast, the current invention is directed to improve the accurate extraction of the character strings as explicitly recited in independent claims 1, 14 and 15. In this regard, the independent claims 1, 14 and 15 requires the determination “whether or not the [black pixel] frame candidate is a [true character] frame” in view of “a white pixel rectangle ... within the [corresponding] parent [black] rectangle.” Thus, independent claims 1, 14 and 15 explicitly recite “extracting a white pixel rectangle that circumscribes continuous white pixels within the parent rectangle of the framed candidate.” (emphasis added). Furthermore, independent claims 1, 14 and 15 each explicitly recite “further determining whether or not the frame candidate is a frame based upon a predetermined set of second criteria includes a comparison of a certain aspect between the white pixel rectangle and the black pixel rectangle.”

For the alleged anticipation of the above quoted claim language, the Examiner has specified various portions of the Yamashita et al. reference. In particular, the Examiner has pointed out lines 42 through 45 of column 4 for anticipating “extracting a white pixel rectangle that circumscribes continuous white pixels within the parent rectangle of the framed candidate” in independent claims 1, 14 and 15. The specified portion of the prior art disclosure reads:

First, the document image data 30 is fetched from the memory 3 (Step 41). Then, white pixel rectangles close to each other with approximately the same height are unified before all rectangles with a length and width larger than a certain value are extracted as vertical and horizontal separators (reference numerals 33 and 34 in FIG. 3) to record the X, Y coordinate values of them on the document image in the area structure storage unit 9.

In the Yamashita et al. reference, the above “white pixel rectangles” are areas 33 and 34 in FIGURE 3. In sharp contrast to the claimed language, “a white pixel rectangle that circumscribes continuous white pixels within the parent [black pixel] rectangle” as explicitly recited in independent claims 1, 14 and 15, the white pixel rectangles 33 and 34 of the cited prior art include the black pixel rectangles. The above claimed language is a clear distinction from the prior art disclosure.

Furthermore, the Examiner has pointed out the Yamashita et al. disclosures at lines 50 through 54 of column 4 for anticipating “further determining whether or not the frame candidate is a frame based upon a predetermined set of second criteria, the second criteria including at least a comparison of a certain aspect between the white pixel rectangle and the black pixel rectangle” in independent claims 1, 14 and 15. The specified portion of the prior art disclosure reads:

A black line 31d with a certain length or more is recorded as a black line separator 35 (Step 42). It is preferable to dynamically determine the threshold values of width and length by examining the distribution of the white pixel rectangle size for each document image.

In alleged anticipation as stated in the pending Office Action, the Examiner has interpreted that the black line is a frame candidate and that the black line is selected based upon a threshold that depends upon the white pixel rectangle size. The above prior art disclosure is again irrelevant for anticipating the patentable features of the current invention as explicitly recited in independent claims 1, 14 and 15. “[A] comparison of a certain aspect between the white pixel rectangle and the black pixel rectangle” is limited

to “a white pixel rectangle that circumscribes continuous white pixels within the parent rectangle” that is the corresponding black pixel rectangle.

Based upon the above described distinctions, independent claims 1, 14 and 15 are clearly distinct over the prior art disclosures in the Yamashita et al. reference. Dependent claims 2 through 13 and 15 through 27 ultimately depend from one of independent claims 1, 14 and 15 and incorporate the patentable features of the independent claims. Therefore, the Applicants respectfully submit to the Examiner that the pending rejections under 35 U.S.C. §102(b) should be withdrawn.

Furthermore, the Applicants also respectfully request the Examiner not to apply the Yamashita et al. reference alone or in combination with other references under 35 U.S.C. §103 in the future Office Action. As generally described above, the Yamashita et al. reference is directed at segmenting the character rows or lines into groups based upon the separators or subseparators. The separators and subseparators include “long, wide, and White pixel regions and long black lines” and “the change of line pitch and character size in the character areas.” In sharp contrast, the current invention as explicitly recited in independent claims 1, 14 and 15 is directed at improving the character “frame” determination among the “character frames” based upon the two set of predetermined criteria with respect to “a white pixel rectangle that circumscribes continuous white pixels within the parent [black] rectangle of the framed candidate.” Not only the objective is different, but also the related objects (white and black pixel rectangles) to which the criteria are applied are distinct from the prior art disclosures. Because of the above distinction in motivation, the Yamashita et al. reference is irrelevant to the patentable features of independent claims 1, 14 and 15. Therefore, the Applicants respectfully submit to the Examiner that the patentable features of independent claims 1, 14 and 15 are not being obvious in view of the Yamashita et al. reference alone or in combination with other prior reference.

Newly Added Claims

Newly added claims in the current response should be also considered for allowance. Since newly added independent claims 28 and 41 have been supported by the original disclosures of the current application, they do not add any new matter to the current application. The subject matter limitations of the newly added claims are equivalent to those patentable features of the above discussed independent claims 1, 14 and 15. For the above reasons, the applicants respectfully submit to the Examiner to enter the newly added claims and allow them in the future Office Action.

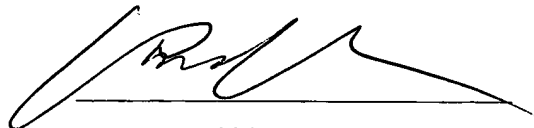
Conclusion

In view of the above amendments and the foregoing remarks, Applicant respectfully submits that all of the pending claims are in condition for allowance and respectfully request a favorable Office Action so indicating.

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Respectfully submitted,



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